



New World Vistas - Precision Aerial Delivery

What It Is:

High Accuracy, Low Cost...We're exploring technologies to improve the accuracy of high-altitude airdrops while reducing the cost compared to parafoil deliveries (this research program is sponsored by the Air Force Office of Scientific Research and Natick).

Why It's Needed:

A new, precise method for aerial deliveries is needed to keep up with U.S. military forces that are growing faster, more mobile and more widely dispersed. We envision precision airdrop becoming the standard method for resupplying both military and humanitarian missions.

How It Works:

We're investigating three key technologies:

- **Advanced (Low Cost) Decelerators...**This includes:
 - **Controllable semi-ballistic decelerators:** a round parachute system is integrated with novel, pneumatic muscle actuators. The result: a system that can be maneuvered autonomously and will maintain an accurate trajectory to the desired drop zone.
 - **High-speed ballistic systems:** The High Altitude Low Opening (HALO) parachute system allows the load to fall through much of the atmosphere before opening. This increases accuracy by minimizing the wind's opportunity to blow the load off target.
- **All Weather Wind Sensing...**Wind data that is more than 3 or 4 hours old may not provide a good indication of what the winds are like over the drop zone when the load is released. This system will assimilate (1) existing weather models with (2) data collected en-route to the drop zone. The recent wind data will greatly increase the likelihood of an accurate drop.
- **Computed Aerial Release Point (CARP)...**Aircraft navigators compute the CARP before take-off using the available weather-model wind data. But this is often many hours before the actual drop is scheduled, when winds at the CARP may be very different. We're developing a mission planner that will let the navigator use updated data as it becomes available to modify the desired DZ(s), and/or wirelessly communicate with autonomous airdrop systems(s) (if they're being dropped), while enroute to the DZ.

Benefits:

Staying Safe...An autonomous system can be released at higher altitudes and longer offset distances. This keeps the aircraft further from any threats and increases the safety of air-crews.

Hitting the Target...A resupply system that's more accurate will be more likely to deliver its loads to the intended users. It also means fewer flights and loads are needed to make up for deliveries that miss their targets.

Point of Contact:

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